

REMARKS

Claims 1-24 are pending. Claims 1, 11, and 21 have been amended.
No new matter has been added.

Objection to Drawings

In paragraph 1, the Office Action states "The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description 285, 295 (Fig. 2d)." Applicants traverse this objection. The reference numbers 285, 295 were already described in the context of FIG. 2b. For example, the instant application serial no. 10/632,574 states on page 5 lines 33 and 34, "Laser beam 285 is focused by lens 201 to position 295 that ..." (emphasis added). Note that FIG. 2b is discussed before FIG. 2d. Therefore, there is no reason nor is there any requirement for repeating the descriptions of reference numbers 285 and 294 in the context of FIG. 2d.

102 Rejection

Claims 11 and 17

In paragraph 3 of the Office Action, Claims 11 and 17 are rejected under 35 U.S.C. § 102(b) as being anticipated by US Patent No. 4,712,100 by Tsunekuni (referred to hereinafter as "Tsunekuni"). The Applicants have reviewed the cited reference and respectfully submit that embodiments of the present invention are not taught or suggested by Tsunekuni.

Amended independent Claim 11 recites "An optical navigation system comprising:

a coherent source for providing a first portion of a beam comprising a first wavelength and a second portion of a beam comprising a second

wavelength onto a target surface, wherein said target surface is not required to have a pattern;

a first detector for receiving a first reflection of said first portion of said beam from said target surface; and

a second detector for receiving a second reflection of said second portion of said beam from said target surface to allow the determination of the position of said first and said second detector with respect to said target surface from signals generated by said first and second detectors in response to said first and second reflections whereby navigation in three dimensions is enabled."

The amendment "wherein said target surface is not required to have a pattern" to Claim 11 is supported in several places in the instant application's written description. For example, page 2 lines 19-20 state, "Navigation capability in the third dimension is useful, for example, for use with writing capture systems for whiteboard type surfaces" (emphasis added). Further on page 2 lines 28-30, the instant application states, "The use of speckle motion allows for optical navigation that is largely independent of the characteristics of the surface to be navigated over."

Support for the amendment to Claim 21 can be found in numerous places in the instant application. For example, on page 2 lines 23-24, the instant application states, "...motion of a speckle pattern is employed to provide for navigation in three dimensions." On page 6 lines 22-24, the instant application states, "...navigation in the third dimension is performed by tracking the motion of speckle spots at the two different wavelengths...as discussed below."

Tsunekuni does not teach or suggest, "...determination of the position of said first and said second detector with respect to said target surface from signals generated by said first and second detectors in response to said first and second reflections," as recited by Claim 11.

For example, at Col. 3 in the abstract, Tsunekuni states, ...optical systems each consisting of a light emitting section to emit the light flux onto this plate and a light receiving section to detect the reflection light flux from the plate.

Further, Tsunekuni does not teach "wherein said target surface is not required to have a pattern," as recited by Claim 11. For example in the abstract Tsunekuni teaches,

A coordinate inputting apparatus comprises: an information plate on which patterns such as white circles and black regions having different reflectances are provided like a matrix; an operating section which is movable over this plate...

Therefore, assuming for the sake of argument that Tsunekuni's information plate 1 is analogous to Claim 11's target surface, Tsunekuni teaches away from "wherein said target surface is not required to have a pattern."

Tsunekuni teaches that the information plate requires a pattern in many other places. For example, at Col. 2 lines 33-40 Tsunekuni states, In the diagram, a reference numeral 1 denotes an information plate in which a plurality of white circles 3 are written like a matrix on a black surface 2; and 4 is an operating section which can be manually freely moved on the information plate 1 and which optically detects a pattern on the plate and thereby driving the information regarding the movement quantity and moving direction of the operating section and the outputting this information.

In another example, Tsunekuni teaches that the information plate requires a pattern in FIGS. 1, 2 and 3 which depicts black surfaces 2 alternating with white circles 3. In yet another example, at Col. 3 lines 35 to 45

Tsunekuni states,

...the light radiated from the light emitting section 9 all enters the light receiving section 14, while almost half of the lights emitted from other light emitting sections 5 and 6 are **absorbed by the black surface 2** ...Consequently, it will be understood that if the position of the operating section 4 is deviated by merely a slight amount to the right or left (in the X-axis direction), **the optical system B won't be influenced at all** but the optical system A and C are shifted to the opposite states.

Tsunekuni even claims an information plate that has a pattern in both of the independent Claims 1 and 6. Therefore, it is apparent that Tsunekuni requires an information plate that has a pattern.

In paragraph 3, the Office Action asserts that the reference "b" depicted in FIG. 3 of Tsunekuni is analogous to "a target surface," as recited by Claim 11. However, first the information plate 1 is the surface that Tsunekuni is trying to determine position with respect to as is indicated, among other things, from FIGS. 1, 2, 3, 4, 6A, 7A and the written description for these figures. The Office Action even admits that the information plate's pattern is used for determining position in that the Office Action states in the Response to Arguments Section, "...the alternating black and white ... is used to detect a change in position." Second, Tsunekuni fails to describe what reference "b" is in his written description.

Further, Tsunekuni does not teach "whereby navigation in three dimensions is enabled," as recited by Claim 11. For example, referring to FIG. 3, Col. 1 line 27 and line 32 Tsunekuni teaches a coordinating inputting apparatus such as a light-pen or a coordinating inputting apparatus that has a rolling ball. Referring to Col. 2 lines 28-36 the coordinate inputting apparatus includes "...an operating section which can be manually freely moved on the information plate." In other words, Tsunekuni's apparatus can be moved in a two dimensional manner along an

x-y plane. In FIG. 5, Tsunekuni depicts the operating section 4 which includes logic 20 and 22 for detecting movement along an x-axis and logic 23 and 21 for detecting movement along a y-axis. However, Tsunekuni's operating section 4 does not include logic for movement along a z-axis because as already pointed out Tsunekuni teaches the type of device that is only moved along an x-y plane.

Therefore, Applicants respectfully submit that Claim 11 is patentable over Tsunekuni because Tsunekuni teaches away from "wherein said target surface is not required to have a pattern," and because Tsunekuni does not teach or suggest "whereby navigation in three dimensions is enabled," as recited by Claim 11. Claim 17 depends on Claim 11 and includes all of the limitations of Claim 11. Therefore, Applicants respectfully submit that Claim 17 is patentable for the same reasons that Claim 11 is patentable.

Claims 21, 23, and 14

In paragraph 4 of the Office Action, Claims 21, 23, and 14 are rejected under 35 U.S.C. § 102(b) as being anticipated by US Patent No. 6,256,016 by Piot et al (referred to hereinafter as "Piot"). The Applicants have reviewed the cited reference and respectfully submit that embodiments of the present invention are not taught or suggested by Piot.

Amended independent Claim 21 recites "An optical navigation system comprising:

a coherent source for providing a light beam incident onto a target surface;

a first detector for receiving a first portion of a reflection of said light beam from said target surface; and

a second detector for receiving a second portion of said reflection of said beam from said target surface to allow the determination of the position of said first and said second detector with respect to said target surface from signals generated by said first and second detectors in response to said first and second reflections whereby navigation in three dimensions is enabled."

Support for the amendment to Claim 21 can be found in numerous places in the instant application. For example, on page 2 lines 23-24, the instant application states, "...motion of a speckle pattern is employed to provide for navigation in three dimensions." On page 6 lines 22-24, the instant application states, "...navigation in the third dimension is performed by tracking the motion of speckle spots at the two different wavelengths...as discussed below."

Piot does not teach or suggest, "... navigation in three dimensions....," as recited by Claim 21. For example, Piot teaches an optical detection and method that detects movement of an optical pointing device such as a mouse which is moved along a two dimensional plane such as a table top or a mouse pad. In another example, Piot states at Col. 4 lines 30-33, "Note that optical matching makes sure that the average size of a speckle image is larger than the pixel for both x and y directions." In yet another example, Piot states at Col. 13 lines 2-5, "The multi-resolution detection system 605 obtains the multi-resolution architecture of speckle images as discussed above and determines a two-dimensional displacement of the optical pointing device 110 as further described below." Piot gives more details on two dimensional navigation at Col. 13 lines 6-54 and Col. 11 lines 1-32, among other places. Piot also states at Col. 7 lines 16-18, "Also, in accordance with the present invention, the underside 220 of the optical

detection system 110 is placed on or in close proximity to the surface 120 during operation." Since Piot requires the underside of the optical detection system to be placed on or in close proximity to the surface then Piot cannot teach "...navigation in three dimensions..."

Therefore, Applicants respectfully submit that Claim 21 is patentable over Piot for at least the reason that Piot teaches away from "... navigation in three dimensions...." Claims 23 and 24 depend on Claim 21 and includes all of the limitations of Claim 21. Therefore, Applicants respectfully submit that Claims 23 and 24 are is patentable for the same reasons that Claim 21 is patentable.

Claims 1, 5, and 8

In paragraph 5 of the Office Action, Claims 1, 5, and 8 are rejected under 35 U.S.C. § 102(e) as being anticipated by US Patent No. 6,730,926 by Boillot et al (referred to hereinafter as "Boilott"). The Applicants have reviewed the cited reference and respectfully submit that embodiments of the present invention are not taught or suggested by Boilott.

Amended independent Claim 1 recites "An optical navigation system comprising:

a light source for providing a light beam having a first wavelength incident onto a target surface;

a coherent source for providing a divergent beam having a second wavelength incident onto said target surface;

a first detector for receiving a second reflection of said light beam from said target surface; and

a second detector for receiving a second reflection of said divergent beam from said target surface to allow determination of the position of said

first and said second detector with respect to said target surface from signals generated by said first and second detectors in response to said first and second reflections whereby navigation in three dimensions is enabled."

Boillot does not teach or suggest, "a coherent source for providing a divergent beam having a second wavelength incident onto said target surface," as recited by Claim 1. For example, the Office Action states, "...providing a divergent beam (stripe pattern) (see Col. 3, lines 21-23 and Col. 5, lines 32-33)..." Therefore it appears to Applicants that the Office Action is asserting that Claim 1's "divergent beam" is analogous to Boillot's stripe-shaped output generated by laser source 16. However, "stripe-shaped" is not synonymous with "divergent."

Further, Boillot does not teach "whereby navigation in three dimensions is enabled," as recited by Claim 1. Although Boillot teaches detecting the position of a defect on a car, Boillot does not teach "navigation" let alone "navigation in three dimensions," as Claim 1 recites.

Therefore, Boillot does not teach or suggest "a coherent source for providing a divergent beam having a second wavelength incident onto said target surface," or "whereby navigation in three dimensions is enabled," as recited by Claim 1. Claims 5 and 8 depend on Claim 1 and includes all of the limitations of Claim 1. Therefore, Applicants respectfully submit that Claims 5 and 8 are patentable for the same reasons that Claim 1 is patentable.

103 Rejections

Claims 3, 4, and 6

In paragraph 7 of the Office Action, Claims 3, 4, and 6 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Boillot. The Applicants have reviewed the cited reference and respectfully submit that embodiments of the present invention are not taught or suggested by Boillot.

As already stated herein, Claim 1 is patentable over Boillot. Claims 3, 4, and 6 depend on Claim 1 and include all of the limitations of Claim 1. Therefore, Claims 3, 4, and 6 should be allowable for the same reasons that Claim 1 should be allowable over Boillot.

Claims 2 and 9

In paragraph 8 of the Office Action, Claims 2 and 9 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Boillot in view of Piott. The Applicants have reviewed the cited references and respectfully submit that embodiments of the present invention are not taught or suggested by Boillot or Piott, alone or in combination.

Piott does not remedy the shortcomings in Boillot for at least the reasons that neither Boillot nor Piott teach or suggest “whereby navigation in three dimensions is enabled,” as recited by Claim 1. Claims 2 and 9 depend on Claim 1 and includes all of the limitations of Claim 1. Therefore, Applicants respectfully submit that Claims 2 and 9 are patentable for the same reasons that Claim 1 is patentable.

Claim 7

In paragraph 9 of the Office Action, Claim 7 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Boillot in view of Tsunekuni. The Applicants have reviewed the cited references and respectfully submit that embodiments of the present invention are not taught or suggested by Boillot or Tsunekuni, alone or in combination.

Tsunekuni does not remedy the shortcomings in Boillot for at least the reasons that neither Boillot nor Tsunekuni teach or suggest "a coherent source for providing a divergent beam," as recited by Claim 1. In fact, the Office Action does not even point out anything in Tsunekuni that teaches "a coherent source for providing a divergent beam." Further Tsunekuni does not remedy the shortcomings in Boillot for at least the reasons that neither Boillot nor Tsunekuni teach or suggest "whereby navigation in three dimensions is enabled," as recited by Claim 1.

Claim 7 depends on Claim 1 and includes all of the limitations of Claim 1. Therefore, Applicants respectfully submit that Claim 7 is patentable for the same reasons that Claim 1 is patentable.

Claim 10

In paragraph 10 of the Office Action, Claim 10 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Boillot in view of U.S. Patent No. 5,907,152 by Dandliker et al. (referred to hereinafter as "Dandliker"). The Applicants have reviewed the cited references and respectfully submit that embodiments of the present invention are not taught or suggested by Boillot or Dandliker, alone or in combination.

Dandliker does not remedy the shortcomings in Boillot for at least the reasons that neither Boillot nor Dandliker teach or suggest "a coherent source for providing a divergent beam" or "whereby navigation in three dimensions is enabled," as recited by Claim 1. In fact, the Office Action does not claim that Dandliker teaches or suggests, "a coherent source for providing a divergent beam" or "whereby navigation in three dimensions is enabled," as recited by Claim 1.

Claim 10 depends on Claim 1 and includes all of the limitations of Claim 1. Therefore, Applicants respectfully submit that Claim 10 is patentable for the same reasons that Claim 1 is patentable.

Claims 12, 13, 15, 16, and 19

In paragraph 11 of the Office Action, Claims 12, 13, 15, 16, and 19 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Tsunekuni. The Applicants have reviewed the cited reference and respectfully submit that embodiments of the present invention are not taught or suggested by Tsunekuni.

As already stated herein, Claim 11 is patentable over Tsunekuni. Claims 12, 13, 15, 16, and 19 depend on Claim 11 and include all of the limitations of Claim 11. Therefore, Claims 12, 13, 15, 16, and 19 should be allowable for the same reasons that Claim 11 should be allowable over Tsunekuni.

Claims 14, 18, and 20

In paragraph 12 of the Office Action, Claims 14, 18, and 20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Tsunekuni in view of Piot. The Applicants have reviewed the cited references and

respectfully submit that embodiments of the present invention are not taught or suggested by Tsunekuni or Piot, alone or in combination.

Piot does not remedy the shortcomings in Tsunekuni for at least the reasons that neither Tsunekuni nor Piot teach or suggest “whereby navigation in three dimensions is enabled,” as recited by Claim 11.

Claims 14, 18, and 20 depend on Claim 11 and includes all of the limitations of Claim 11. Therefore, Applicants respectfully submit that Claims 14, 18, and 20 are patentable for the same reasons that Claim 11 is patentable.

Claim 22

In paragraph 13 of the Office Action, Claim 22 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Piot. The Applicants have reviewed the cited reference and respectfully submit that embodiments of the present invention are not taught or suggested by Piot.

As already stated herein, Claim 21 is patentable over Piot. Claim 22 depends on Claim 21 and includes all of the limitations of Claim 21. Therefore, Claim 22 should be allowable for the same reasons that Claim 21 should be allowable over Piot.

Conclusions

In light of the above remarks, Applicants respectfully request reconsideration of the rejected claims.


Based on the arguments presented above, Applicants respectfully assert that Claims 1-24 overcome the rejections of record and, therefore, Applicants respectfully solicit allowance of these claims.

The Examiner is invited to contact Applicants' undersigned representative if the Examiner believes such action would expedite resolution of the present Application.

Respectfully submitted,

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